RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH

SUBJECT TITLE : ORION

PERIOD COVERED : OCTOBER - DECEMBER 1988

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KEYWORDS : sidestream-smoke-yield, sidestream-smoke-composition, calypso

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OBJECTIVE
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To investigate the influence of filler density and cigarette paper on SS yield and composition.

RESULTS
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The five prototypes of the ORION I series (increasing filler density; WP60 cigarette paper) [1] and the ten prototypes of the ORION II series (increasing filler density; self-extinguishing and low static burning rate cigarette paper, respectively) [2] were smoked again in order to confirm the results which were obtained and discussed earlier [3,4]. The results were confirmed. Final results are listed in Tables 1, 2, 3 and 4.

A final report is in preparation and will be finished by the end of February.

PLANS
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A new project (CALYPSO) will be started and is designed to further investigate the possibilities of reducing SS yields, by varying the wrapper and its physical properties and/or varying the physical properties and appearance of cigarette prototypes.

REFERENCES
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[1] Pestlin-S., Quarterly Report, July-September 1987, pp. 32-33.
[2] Pestlin-S., Quarterly Report, April-June 1988, pp. 27-28.
[3] Pestlin-S., Quarterly Report, October-December 1987, pp. 46-51.
[4] Pestlin-S., Quarterly Report, July-September 1988, pp. 31-32.

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TABLE 1 : Sidestream smoke room values and coal temperatures of ORION prototypes with varying densities and WP60 cigarette paper

Parameter		89P	87P	85P	83P	75C1
Density	mg/ml	200	225	250	275	300
DMNA	ng/puff	26	27	50	46	42
NAB	"	--	--	--	--	--
NAT	"	--	--	--	--	--
NNK	"	120	125	125	91	103
NNN	"	--	--	--	--	--
NH3	mg/puff	1.26	1.26	1.14	0.90	0.96
HCN	"	0.05	0.05	0.05	0.04	0.05
Acetaldehyde	"	0.33	0.34	0.30	0.30	0.24
Formaldehyde	"	0.11	0.12	0.10	0.08	0.06
Nicotine	"	0.73	0.77	0.65	0.57	0.55
NO	"	0.28	0.31	0.31	0.25	0.29
CO2	"	63.88	68.26	62.04	53.70	65.60
CO	"	6.45	6.80	6.94	5.82	6.41
Visibility (ref. 2R1 = 1)	1/puff	0.13	0.14	0.12	0.11	0.12
Dynamic coal temp.	°C	970	1008	978	961	953
Static coal temp.	"	652	652	648	638	644

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TABLE 2 : Sidestream smoke room values of ORION prototypes with varying densities and self-extinguishing cigarette paper (535-17P)

Parameter		105P	103P	101P	99P	97P
Density	mg/ml	200	225	250	275	300
DMNA	ng/puff	26	18	14	17	18
NAB	"	--	--	--	--	--
NAT	"	--	--	--	--	--
NNK	"	66	55	38	41	51
NNN	"	--	--	--	--	--
NH3	mg/puff	0.49	0.48	0.49	0.58	0.54
HCN	"	0.02	0.02	0.02	0.02	0.02
Acetaldehyde	"	0.15	0.16	0.16	0.18	0.16
Formaldehyde	"	0.09	0.06	0.06	0.06	0.05
Nicotine	"	0.29	0.22	0.25	0.34	0.28
NO	"	0.10	0.12	0.12	0.13	0.11
CO2	"	29.24	26.21	23.95	31.85	31.79
CO	"	2.72	3.23	2.41	2.97	2.77
Visibility (ref. 2R1 = 1)	l/puff	0.06	0.07	0.07	0.06	0.06

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TABLE 3 : Sidestream smoke room values of ORION prototypes with varying densities and low static burning rate cigarette paper (535-26P)

Parameter		115P	113P	111P	109P	107P
Density	mg/ml	200	225	250	275	300
DMNA	ng/puff	16	16	11	19	17
NAB	"	--	--	--	--	--
NAT	"	--	--	--	--	--
NNK	"	61	73	43	37	42
NNN	"	--	--	--	--	--
NH3	mg/puff	0.50	0.45	0.50	0.56	0.49
HCN	"	0.03	0.03	0.02	0.02	0.02
Acetaldehyde	"	0.18	0.21	0.20	0.19	0.19
Formaldehyde	"	0.08	0.07	0.07	0.06	0.06
Nicotine	"	0.27	0.29	0.25	0.24	0.24
NO	"	0.13	0.13	0.12	0.13	0.12
CO2	"	32.28	34.36	29.90	35.86	29.38
CO	"	3.49	3.42	3.36	3.32	2.98
Visibility (ref. 2R1 = 1)	l/puff	0.08	0.07	0.08	0.07	0.07

-- : below detection limit

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TABLE 4 : Sidestream smoke room values for particulate matter of ORION prototypes

Prototype	Nb of puffs	Particulate matter	
		RAM $\frac{(\text{max.deflection})}{\text{puff}} \times 10$	TEOM (mg/puff)
075C1	5	2.01	2.32
083P	5	1.94	2.30
085P	4	1.95	2.17
087P	3	1.93	2.22
089P	3	2.19	2.39
097P	8	1.07	1.19
099P	7	1.21	1.32
101P	7	1.38	1.43
103P	6	1.40	1.49
105P	5	1.34	1.26
107P	7	1.56	1.44
109P	6	1.57	1.44
111P	6	1.59	1.59
113P	5	1.49	1.46
115P	5	1.71	1.58

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